Plan Title:	**Jeffersonville Operations**
Plan Number:	**CB-FD-94-02-E**
Plan ID:	**IT**

PART I - INFORMATION TECHNOLOGY ARCHITECTURE PLAN

1. Information Requirements

A. Introduction

The primary mission of the Bureau of the Census is to collect, tabulate, and publish statistical information about the Nation's people and economy. A listing of the significant programs and projects that the Data Preparation Division (DPD) supports is included in Appendix A. Major activities the DPD does in support of this mission include:

- Serving as a distribution and collection center for imprinting names and addresses on forms and preparing mailing labels and packages required by the various censuses and surveys. We distribute to respondents either by direct mail or through the 12 regional offices.

- Producing and maintaining United States maps used in data collection and data publications and maintaining geographic files and coding systems.

- Performing necessary editing, coding, and other clerical operations on respondent data before data transcription and computer processing.

- Performing necessary data transcription and transmission operations (converting handwritten, typed, or telephonic data into computer-readable form) before processing by the Census Bureau's mainframe computer systems.

- Serving as a Computer-Assisted Telephone Interview (CATI), Computer Assisted Data Entry (CADE), and various other Computer-Assisted Interview (CAI) technologies site for survey and census data collection and editing.

B. Information Flow

The Data Preparation Division is a multifunctional site in terms of its data capture capabilities. The DPD uses a variety of methods to contact respondents and capture their responses. These methodologies range from mailing out and receiving survey forms, recording data via telephone interviews, mailing out and receiving diskettes, recording respondent data via telephone keypad entries, voice recognition, recording data into a system from paper forms or electronic images, and recording data via paperless facsimiles. These data capture methodologies are discussed in detail in Section 2, Paragraph A, "Current Architecture."

The DPD is in the process of converting from a traditional "heads down" data entry keying operation to a range of diverse data capture methodologies that will increase accuracy, decrease costs, and provide easier ways for our respondents to send the data to us.

In an average non-census year the DPD processes about 30-35 million documents. The clerical operations required to process this many documents could be greatly improved through additional automation. Our purpose is to provide the needed systems, equipment, and trained personnel for the automation of a wide range of these activities.

We accomplish these important activities in eight buildings containing about 900,000 square feet spread over 80 acres. During decennial processing we acquire additional space. Many of these activities are manual/semi-automated labor-intensive, slow, and error prone. Personnel required to do these functions range from 1,100 persons in a non-census year to about 2,800 in a decennial census year.

We are in the process of automating these processes. By automation of these processes, we will enhance our ability to accomplish our mission in a more efficient and cost-effective manner.

Agency components involved include the Data Preparation Division, all divisions and staffs within the IT Directorate, the Field Directorate, the CASIC Staff, the Geography Division, the Economic Planning and Coordination Division (EPCD), the Procurement Division, and the Technology Management Office (TMO).

Appendix A provides a list of significant programs and/or projects for which the Bureau of the Census accumulates, prepares, processes, and provides information to Federal, State, and Local Governments and the private sector.

2. Planned Processing and Telecommunications Architecture

A. Current Architecture

The Data Preparation Division is a multi-function site for data capture. The unique data capture methodologies employ a variety of hardware architectures and software configurations that support the technology being employed. These data capture methodologies and the associated architecture is briefly described in the following paragraphs.

1. Data Entry Keying (Traditional). This is the traditional "heads-down" data entry keying method wherein surveys/censuses are mailed to respondents, returned to DPD, edited by a clerical staff, and then the data on the forms are keyed via terminals into a dedicated data entry system. The Census Bureau uses two basic systems at the Data Preparation Division.

    a. Recognition International *TARTAN*™ System. This is a proprietary hardware and software system manufactured by Recognition International located in Dallas, Texas. There are 15 terminals in each unit attached to a disk pack storage device. Each of the 15 intelligent terminals has its own processor and a small amount of onboard memory so that if one of the 15 terminals malfunctions, the remaining terminals can continue to process data. The proprietary software has vast on-line, programmable editing capability. There are 12 15-terminal units currently being used in DPD.

    b. Digital Equipment Corporation Minicomputer System and Viking™ Data Entry Software. This combination of Digital Equipment Corporation hardware, network devices, and operating system software is combined with proprietary Viking™ data entry software by Viking Software located in Tulsa, Oklahoma. The Digital Equipment Corporation operating system software is VMS version 5.5-2. This software is run on a combination of DEC MicroVAX 3500s, DEC VAX 8810s, and VAX 8250s. DPD currently uses 200 DEC terminals for data entry keying and additional 1,000 DEC terminals are used for various office automation and clerical processing tasks in DPD.

2. Computer Assisted Telephone Interview (CATI). This system consists of microcomputers networked via Compaq servers running Novell network operating system software (version 3.12). The microcomputers utilize Intel 80486DX2, 66 MHz CPUs, MS-DOS 6.22 operating system, 3COM 3C509 network interface cards, connected to 10BASE-T, RJ45, 10 megabit cabling off of a 100 megabit fiber optic Ethernet™ backbone. The microcomputer components are considered as "commodity items" rather than proprietary hardware. The software was developed within the Census Bureau utilizing an off-the-shelf database package, BTRIEVE™.

    Surveys and censuses are conducted by a Census Bureau interviewer calling a respondent, asking the survey/census questions, and recording the answers on a microcomputer. Editing of the data is accomplished at the time of data input (i.e., simultaneously with the recording of the respondents' answers).

3. Computer Assisted Data Entry (CADE). This system consists of microcomputers networked via Compaq servers running Novell network operating system software (version 3.12). The microcomputers utilize Intel Pentium 100 MHz CPUs, MS-DOS 6.22 and IBM OS/2 2.1 operating systems, 3COM 3C509 network interface cards, connected to 10BASE-T, RJ45, 10 megabit cabling off of a 100 megabit fiber optic Ethernet™ backbone. The microcomputers components are considered as "commodity items" rather than proprietary hardware. The software, Key Entry III™ by Southern Computer Systems, Inc. of Birmingham, Alabama, allows greater editing flexibility and has more editing capability than the *TARTAN*™ or Digital Equipment Corporation - Viking™ software data entry platforms.

   This system captures data in the same manner as the current *TARTAN*™ and Digital Equipment Corporation data entry systems.

   CADE began production processing in FY 1996 as previously identified surveys were converted to the CADE system, thus replacing the *TARTAN*™ data entry system. Additional programs/projects are being converted from *TARTAN*™ to CADE.

4. Touchtone Data Entry and Voice Recognition Entry (TDE/VRE). These methodologies capture data by the respondent answering survey/census questions by entering responses on a telephone keypad or by speaking the number of a choice into a telephone.

5. Computerized Self-Administered Questionnaire (CSAQ). This system consists of a floppy disk containing the survey/census questions being sent to the respondent. The respondent uses his/her microcomputer to answer the survey/census and mails the disk back to the Census Bureau. The Census Bureau reads the disk into our system to capture the data on an in-house developed database application.

6. Imaging Capture System. This system consists of a Kodak image capture subsystem to scan and retain the image of a document coupled with an Oracle database software application running on a SUN Microsystems SPARCstation. The operating system is SOLARIS (UNIX) from SUN Microsystems. The SPARCstation and Oracle database tracks the document image as similar components of different documents are parsed and routed to the data entry operators. Thus, one data entry operator may just key in addresses from all the documents in a specific group. The image on the screen will be the scanned image of the original document. The operator will key in that data from the monitor screen rather than from the original document. The Oracle database system will track the parsed document components and its relation to the original document.

7. Paperless FAX Administered Integrated Retrieval System (PFIRS). This system consists of an electronic survey/census form being sent to the respondent's FAX number. If the respondent has a computer modem, the respondent has the choice of either answering the form electronically and sending it back to the Census Bureau electronically, or the

respondent can print the form and then mail the completed form to the Census Bureau. If the respondent has a normal telephone FAX machine, then the form will be printed, filled out, and mailed back to the Census Bureau.

The Census Bureau will either receive the completed form electronically or will scan in the paper form. Either way, the image will be captured electronically for input into the survey/census data base.

B. Alternatives

1. Status Quo. This is not practical because the existing technology base is not sufficient to meet present and future needs of the Census Bureau.

2. The individual program development plans included in this submission and their subsequent requirement initiatives will identify the appropriate alternatives considered and selected.

C. Proposed Architecture

The Data Preparation Division is the Census Bureau's survey/census mailout and multi-functional data capture facility. By design, all DPD computer hardware architecture and software is compatible and interoperable with all other Bureau systems. This will continue to be a criteria for all current and future computer hardware/software acquisitions.

The architecture is described in detail in Section 2, Paragraph A "Current Architecture." The Census Bureau is committed to an "open systems" architecture. The Bureau is currently utilizing Intel and Intel compatible CPUs, and anticipates continuing to do so in the near future.

D. Benefits

Anticipated benefits are both tangible and intangible. Cost avoidances resulting from labor savings will be provided in more detail as we develop requirement initiatives to support the various components of this plan. Besides reducing cost, further automation will decrease the time required to process surveys and censuses; increase the quality of work processed; increase the consistency of coding and similar activities; decrease requirements for paper, calculators, reference materials, and other supplies; provide better information for management decisions; replace many manually/semi-automated prepared management reports with automated reports that are more timely and more accurate; and provide other advantages that become available when we automate labor-intensive operations. Similar benefits will be realized by other Census Bureau divisions because of the improved response time and more efficient service provided by the DPD. Finally, the various data capture methodologies will reduce the reporting burden on our respondents allowing the Bureau to capture more data with greater accuracy at less cost.

E. Performance Measures

Performance measures will be based on the comparative costs of capturing a field of data from the old methodology to the equivalent cost using the replacement methodology(s).

3. Security

Confidentiality of data as required by Title 13, United States Code, and Title 26, United States Code will be ensured. Also, we will observe security precautions required by OMB Circular A-130 and the Department of Commerce Security Manual.

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PART II - THE IT ANNUAL PLAN

1. Architecture Status

The Data Preparation Division is currently using all of the architectures described in Part I, Section 2, paragraph A of this plan. DPD is in the process of phasing out the Digital Equipment Corporation/Viking™ software and the *TARTAN*™ data entry systems. These systems are being replaced by several CASIC initiative technologies including CATI, CADE, CAPI, Image Capture, TDE/VRE, CSAQ, and PFIRS.

2. IT Objectives

The Data Preparation Division intends to implement, maintain, or continue the following IT objectives.

Although sufficient equipment is not available for completion of all requirements, we have made considerable progress in several areas. Personnel resources are available to design systems, acquire and install equipment, and provide training for the following activities:

- Microcomputer and Network Maintenance Shop. DPD maintains a limited number of spare components for repair of the Division's microcomputers and network hardware.

- Data Capture, Collection, Edit, and Dissemination Methodologies. The *TARTAN*™ data entry is being replaced with CASIC developed methodologies (eg. CATI, CADE, CAPI, CSAQ, PFIRS, Image capture).

- DPD Modernization: The Data Preparation Division will develop requirements initiatives to procure the hardware/software platforms for the following areas.

    - Microcomputer Upgrade/Replacement. This represents an ongoing requirement to upgrade existing technology.

- Upgrade Peripheral Hardware. This will provide the DPD with the capability to upgrade peripheral equipment that is used in conjunction with microcomputer systems throughout the division.

- Upgrade Automation Software. This will provide the DPD with the capability to upgrade division software that is used in conjunction with microcomputer systems throughout the division.

- Upgrade Local Area Network. This will provide the DPD with the network capability to throughput network data at the same rate as LANs in Suitland and Charlotte.

- Printer Maintenance. This provides the DPD with printer maintenance support for high-speed printers, laser printers, and dot matrix printers.

- Census and Survey Mailout Operations. The Data Preparation Division has a requirement to replace or upgrade mailout equipment that is obsolete or nonrepairable. Much of this equipment is 15-20 years old and has far exceeded its useful life. The DPD will discuss specific equipment needs and how they will be addressed in the CASIC concept under the STAMP initiative.

- Personnel Administrative Support System. The Data Preparation Division will develop a requirements initiative to procure the hardware/software platforms for the following personnel management functions.

  - Federal Job Information Touchscreen Computer. This system will combine microcomputers, synthetic voice, and touchscreen to provide current competitive employment information and local vacancy announcements.

  - Federal Employment Information System (FEIS). This system is a microcomputer based extension of the Federal Job Opportunity Listing issued by OPM. This system will provide information about job openings, nationwide examinations, pay scales, testing information, and job qualifications.

  - Employee Express Kiosk. This interactive system allows Commerce Department employees to update personal data in their employee file.

- Network/Technical Diagnostic Tools. The Data Preparation Division has a need to acquire diagnostic tools for Technicians and Staff Specialists in areas pertinent to assigned division missions.

3. Status

A. Accomplishment/Progress

The following paragraphs expand on the project descriptions that were initially identified in Part II, Section 2, "IT Objectives."

- Microcomputer and Network Maintenance Shop.

  Provide maintenance support for the Census Bureau Computer-Assisted Personal Interview (CAPI) hardware through a centralized laptop microcomputer repair depot in the Data Preparation Division. We currently support the 2,500 laptop microcomputers deployed in Field Division. This number is scheduled to increase by approximately 3,000 more laptops in the next fiscal year. This plan provides for limited maintenance of the Division's microcomputers, printers, peripheral equipment, local area network and network components.

- Data Capture, Collection, Edit, and Dissemination Methodologies.

  The *TARTAN*™ systems are 8 years old and the DEC MVIIIs were 5 years old at the end of the 1992 Agriculture/Economic Censuses. The *TARTAN*™ maintenance contract including all options will expire in FY 1997. Computer Assisted Survey Information Collection (CASIC) methodologies as described in Section 2, Paragraph A "Current Architecture," (e.g., CATI, CADE, TDE/VRE, CSAQ, Image Capture, and PFIRS) are being implemented or are in use. Current and future Census Bureau programs/projects are scheduled for conversion from the *TARTAN*™ "heads down" data entry keying system to one of these CASIC methodologies. The replacement will be phased in during FY 1995-1996. It is expected that all Tartan systems will be phased out by the end of FY 1997.

  A "test bed" of hardware and data entry software was acquired and rigorously tested in FY 1995. Requirements initiatives to acquire the complete CADE buildout over a 3-year period (FY 1995-FY 1997) has been submitted and approved. The remainder of the CATI site hardware and software will also be acquired in FY 1995-FY 1997.

- DPD Modernization: The Data Preparation Division will develop requirements initiatives to procure the hardware/software platforms for the following areas.

  - Upgrade/Replace Microcomputers. The Data Preparation Division will replace the entire range of Intel 80486 and 80386 technology microcomputers with Intel Pentium (or higher) equivalent technology over a 3-year period. All older technology will be deinstalled and excessed. A new requirements initiative will be developed and submitted for this plan.

  - Upgrade Peripheral Hardware. This will provide the DPD with the capability to upgrade peripheral equipment that is used in conjunction with microcomputer

systems throughout the division. Equipment upgrades will be in areas of dot matrix printers, laser printers, high density floppy diskette drives, CD-ROM drives, CPU upgrades, video accelerator upgrades, laptop microcomputer acquisition, scanners, et cetera.

- o Upgrade Automation Software. This will provide the DPD with the capability to upgrade division software that is used in conjunction with microcomputer systems throughout the division. Software upgrades will be in the areas of operating systems, network versions, spreadsheets, databases, word processing, network management, diagnostics, GUIs, et cetera.

- o Upgrade Local Area Network. This will provide the DPD with the network capability to throughput network data at the same rate as LANs in Suitland and Charlotte. This will eliminate the majority of bottlenecks in network communications between Suitland, Charlotte, and Jeffersonville as well as providing system-wide back-up capability in the event of a catastrophic event at one of the three sites. See the Telecommunications IT Plan (CB-IT-94-02-E) for cost and support.

- Printer Maintenance. This provides the DPD with printer maintenance support for high-speed printers, laser printers, and dot matrix printers. Use of a competitive bid maintenance contract allows the DPD to have access to a readily available source of spare parts and remedial maintenance service, thus minimizing production work interruptions.

- Census and Survey Mailout Operations. The Data Preparation Division has a requirement to replace or upgrade mailout equipment that is obsolete or nonrepairable. Much of this equipment is 15-20 years old and has far exceeded its useful life. The DPD will discuss specific equipment needs and how they will be addressed in the CASIC IT Plan under the STAMP initiative. Major areas of concern include the following subject areas.

  - o Ink Jet Addressing Equipment (Upgrade and Replacement) (Covered in ECPD IT Plan)
  - o Automated Inserting Equipment (Upgrade and Replacement) (Covered in ECPD IT Plan)
  - o Upgrade Image Link Cameras

- Personnel Administrative Support System. The Data Preparation Division will develop a requirements initiative to procure the hardware/software platforms for the following personnel management functions.

  - o Federal Job Information Touchscreen Computer. This system will combine microcomputers, synthetic voice, and touchscreen to provide current competitive employment information and local vacancy announcements.

- o Federal Employment Information System (FEIS). This system is a microcomputer based extension of the Federal Job Opportunity Listing issued by OPM. This system will provide information about job openings, nationwide examinations, pay scales, testing information, and job qualifications.

- o Employee Express Kiosk. This system allows Commerce Department employees to update their employee files in the areas of Federal Tax Withholdings, State Tax Withholdings, Direct Deposit of Net Pay, Direct Deposit of Allotments, Residence Mailing Addresses, and Check Mailing Addresses.

- Network/Technical Diagnostic Tools. The Data Preparation Division has a need to acquire diagnostic tools for Technicians and Staff Specialists in areas pertinent to assigned division missions.

  These areas include fiber optic cabling and maintenance, unshielded twisted pair hub cabling and maintenance, network laser-link connectivity, T-1 (and higher) familiarity, Novell Netware (ver. 3.12 or higher) systems familiarity, desktop and laptop microcomputer maintenance, microfilm readers maintenance, laser and ink-jet printing maintenance, and local/wide area network troubleshooting and maintenance.

B. Current Plans

The Census Bureau is actively completing the build-out of the various CASIC "test-bed" initiatives, and is converting programs/projects to the appropriate data capture methodology.

4. Implementation Schedule

We anticipate that the scope of our plans will require multiple requirement initiatives, justifications, and competitive procurements.

Requirement Initiatives or Justifications:		
Activity	Target	Actual
Data Capture Methodologies (TARTAN Maintenance Contract)	FY 1994-97	
Data Capture Methodologies (Replacement)	FY 1995-97	
Personnel Administrative Support System	FY 1995-97	
Upgrade/Replace Microcomputer	FY 1995-2002	
Upgrade Automation Hardware	FY 1995-2002	
Upgrade Automation Software	FY 1995-2002	
Upgrade Local Area Network	FY 1995-2002	
Microcomputer and Network Maintenance Shop	FY 1996-2002	
Census and Survey Mailout Operations	FY 1996-2002	
Network/Technical Diagnostic Tools	FY 1995-2002	

Requirement Initiatives or Justifications:		
Activity	Target	Actual
Computer-Assisted Personal Interview (CAPI) Maintenance	FY 1995-2002	

APPENDIX A - Significant DPD Programs and Projects

The following is a list of significant programs and/or projects for which the Bureau of the Census accumulates, prepares, processes, and provides information to Federal, State, and Local Governments and the private sector.

PROJECTS	MAJOR PROGRAM TITLES
0904	ANNUAL HOUSING SVY NATL
0907	ANNUAL HOUSING SVY - METROPOLITAN SAMPLE
0911	CENS SVY MATCH DECENNIAL
0914	CBO
1006	ANNUAL TRADE SVY
1010	ANNUAL RETAIL TRADE SVY
1025	SERVICE ANNUAL SVY
1036	BSR QTRLY BIRTHS
1052/1050	BLDG. PERMITS
1053	HOUSING STARTS
1152	CURRENT INDUSTRIAL REPORT
1153	ANNUAL CAPITAL EXPENDITURES SVY
1172/1153/7146	SVY OF PLANT CAPACITY
1222	IMPORTS
1230	EXPORTS
2033	MFD SPEC LIST
3042	TRUCKING INVENTORY AND USE SVY
3060	ASSETS AND EXPENDITURES SVY
3064	SIC
3066	GEO CODING
4701	BOUNDARY AND ANNEXATION SVY
5317	MPO MAP SHOT
5362	OUTREACH EVALUATION
5363	ALTERNATIVE QUESTIONNAIRE EXP.
5366	QUALITY CONTROL STUDIES
5372	ETNOGRAPHIC EVALUATION

PROJECTS	MAJOR PROGRAM TITLES
5689	AICS
6361	SPECIAL CENS 2000
7113	MANUFACTURING ENERGY CONSUMPTION SVY
7103/3093/7105	COMMODITY FLOW SURV
7147	SVY OF MANUFACTURER TECHNOLOGY
7154	LIBRARY SVY REINTERVIEW
7158	SCHOOL & STAFF SVY
7159	TEACHER FOLLOWUP SVY
7167	SCHOOL & STAFF SVY PRELIST
7168	SCHOOL & STAFF SVY RESEARCH
7170/7171	INTEGRATED POSTSECONDARY EDUCATION DATA SYSTEM
7173	PRIVATE SCHOOL SVY
7174	LIBRARY SVY
7178	NATL EDUCATION COMMON CORE DATA SVY
7225	NATL DEATH INDEX
7227	TEENAGE ATTITUDES AND PRACTICES
7230	NATL HEALTH PROVIDER INVENTORY
7234	NATL MORTALITY FOLLOWBACK SVY
7244	BOARD AND CARE SVY
7247	NATL HEALTH INTERVIEW SVY
7250	LONGITUDINAL STUDY ON AGING
7267	ACCESS TO CARE SVY
7309	NATL MATERNAL AND INFANT HEALTH SVY
7375	WORK EXPERIENCE
7403	CONSUMER EXPENDITURE
7421	CURRENT POINT OF PURCHASE CATI
7425	CURRENT POINT OF PURCHASE
7457	HOUSING SALES
7466	MARKET ABSORPTION
7470	MOBILE HOMES SVY

PROJECTS	MAJOR PROGRAM TITLES
7481	SURVEY OF COLLEGE GRADUATES
7483	SVY RESEARCH AND DEVELOPMENT
7521	CENSUS OF JAILS
7522	NATL JUDICIAL REPORTING PROGRAM
7523	NATL CRIME AND VICTIMIZATION SVY
7527/7532	NATL CORRECTION REPORTING PROGRAM
7531	JUVENILES TAKEN INTO CUSTODY
7533	NATL PRISONER SVY - INMATES FEDERAL CORRS
7536	SVY LOCAL INMATES
7537	JAIL SAMPLE SVY
7540	JUVENILE FACILITY CENSUS
7542	CENS OF PROBATION AND PAROLE AGENCIES
7543	NATL PROSECUTORS SVY PROGRAM
7544	LAW ENFORCEMENT SVY
7547	NATL PRISONER SVY - INMATES STATE CORRS
7548	PRISONERS CENSUS
7689	FISH HUNT AND WILDLIFE RECREATION SVY
8918/8913	NEW YORK CITY HOUSING AND VACANCY SVY
9222	LONG TERM CARE